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MEMORANDUM

TO: Heads of Fire Departments

FROM: Stephen D. Coan
State Fire Marshal

DATE: October 5, 2007

SUBJECT: **Special Amusement Buildings for Halloween and other Special Events**

We are reissuing this memo as a reminder that Massachusetts has moved into the "Halloween season". This memo was originally a communication that was sent to all the fire officials and building inspectors in the Commonwealth. The Halloween season is a fun time of the year to be enjoyed, but as fire officials the Halloween season generates common Life-Safety issues, particularly where "haunted houses" and/or "fun houses" are operated and open to the public as ASSEMBLY USE buildings or portions thereof. This memorandum contains information from that original memo referencing relevant sections of both the fire and building codes. We strongly recommend that both local fire and building officials work together when addressing these life-safety issues. The Department of Public Safety will be providing additional information on their website, as well, regarding this subject (www.mass.gov/dps).

Such Life-Safety issues become glaringly apparent when one reviews the history of the tragic May 11, 1984 fire in the "Haunted Castle" at the Six Flags Great Adventure Park in New Jersey, which resulted in the deaths of eight (8) visitors due to their inability to immediately exit the amusement structure or when one considers the October 27, 1973 Washington Reid School PTA "haunted house" fire in which one half hour before a PTA-built "haunted house" maze was to be open for children's use, the maze caught fire killing one of the PTA volunteer members helping to construct the maze (see synopsis at the end).

In the case of the Six Flags fire, major factors¹ contributing to this loss of life included:

- The failure to detect and extinguish the fire at its incipient stage by means of fixed fire detection and suppression systems, and;
- The ignition of synthetic foam materials and subsequent fire and smoke spread involving combustible interior finishes, and;
- The difficulty of escape by occupants based on fire conditions in the "haunted-house" type of environment.

¹ BOCA National Building Code / 1993 Commentary, Section 413 SPECIAL AMUSEMENT BUILDINGS

In order to assist both Local Building Officials and Fire Officials, as well as the Regulated Community, included in this letter are:

- an overview of the requirements of the Massachusetts State Building Code (780 CMR) regarding these Code-classified SPECIAL AMUSEMENT BUILDINGS, and;
- an overview of requirements of the Massachusetts Fire Prevention Regulations (527 CMR) for such building operation and maintenance, and;
- an overview of the two(2) fatal fires

**SPECIAL REQUIREMENTS OF CHAPTER 4, SECTION 413 of the Massachusetts State Building Code
(780 CMR)**

NOTE: REQUIREMENTS OF THE STATE BUILDING CODE ARE LEGALLY ENFORCED BY BUILDING
OFFICIALS

The SPECIAL AMUSEMENT BUILDING requirements of Chapter 4, Section 413 of the BOCA National Building Code / 1993 were created as a direct result of the subject Six Flags “Haunted Castle” fire and have been directly adopted into the Sixth Edition of the Massachusetts State Building Code and thus form the basis for Special Occupancy Life-Safety design and construction requirements for such amusement buildings or portions thereof.

A SPECIAL AMUSEMENT BUILDING, as defined by the Massachusetts Sixth Edition Building Code, Chapter 4, Section 413 is defined as:

1. any temporary, or permanent or mobile building or portion thereof which is occupied for amusement, entertainment or educational purposes, and;
2. which contains a device or system which conveys passengers or provides a walkway along, around or over a course in any direction so arranged that the means of egress path is not readily apparent due to visual or audio distractions or is intentionally confounded or not readily available due to the nature of the attraction or mode of conveyance through the building or structure.

When buildings or portions thereof are classified as SPECIAL AMUSEMENT BUILDINGS, Section 413 of the Sixth Edition of the Massachusetts State Building Code (780 CMR) requires:

1. Fire detection in accordance Chapter 9, Section 918.

--with exceptions recognizing that ambient temperature and other ambient conditions of the building or portion thereof (the building may not be heated and therefore detection devices could be installed in violation of their ambient temperature listing) may preclude the use of certain fire detection devices and therefore the use of approved alternative types of automatic detection would be allowed--

2. Automatic sprinklers in accordance with Chapter 9, section 906.

--with an exception that does not require automatic sprinklers where the floor area of a temporary special amusement building is less than 1000 sq. feet and the travel distance from any point to an exit is less than 50 feet—

3. Response requirements to fire protection system activation, including:

- Immediate illumination of the means of egress with light of not less than 1 foot-candle at the walking surface level, and;
- The shutting off or otherwise stopping of any conflicting or confusing sounds and visual distractions, and;
- The activation of an approved directional exit marking that will become apparent in an emergency, and;
- The immediate sounding of an alarm at the building at a constantly attended location and from where manual initiation of cited requirements can be achieved.

4. A public address system is required.

5. Exit signs are required.

6. and where mirrors, mazes or other designs are used to confound the means of egress paths, approved low-level exit signs and directional path markings shall be provided and located not more than 8 inches above the walking surface and on or near the means of egress path –

6. The interior finish shall be of Class 1 materials only, per Chapter 8, Section 803.

7. **Where Chapter 4, Section 413 is silent, the main body Code requirements shall otherwise apply for ASSEMBLY USE buildings or portions thereof and with consideration of MIXED USE separation, if applicable.**

<p>REQUIREMENTS OF THE FIRE PREVENTION REGULATIONS OF MASSACHUSETTS (527 CMR)</p>
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<p>NOTE: REQUIREMENTS OF 527 CMR, AS NOTED BELOW, ARE ENFORCED BY THE HEAD OF THE FIRE DEPARTMENT OR HIS DESIGNEE</p>

1. 527 CMR 1.00: ADMINISTRATION AND ENFORCEMENT

1.06: Orders to Eliminate Dangerous or Hazardous Conditions

(1) Fire Code Violations. Whenever the marshal, the head of the fire department or any person to whom the marshal or head of the fire department has delegated is authority in writing, finds in any building or upon any premises a violation of 527 CMR or any condition likely to cause fire or any obstacle to easy ingress or egress from such building, they shall, in writing, order the same to remedied. Notice of the violation shall be served in accordance with the provisions of M.G.L. c. 148, § 5, including, but not limited to the following:

- (k) The use of any machine, devise or chemical to create fog, foam or a haze-like visual effect which could become an obstacle to ingress or egress from any place of assembly.

2. 527 CMR 21 – Decorations, Curtains, Draperies, Blinds and Other Window Treatments

Definitions:

Decorations – All materials such as scenery, plastic shields, streamers, and also cloth, cotton batting, straw, vines, leaves, trees and moss used for decorative effect, bamboo and other wood fibers, cardboard and other paper products.

Public Spaces: -- Those spaces within the occupancy accessible by the public while the building is occupied. This shall include all components of the means of egress such as exit accesses and exits.

Test requirements: Test completed per 527 CMR 21 or National Fire Protection Association (NFPA) 701.

3. 527 CMR 10 – Fire Prevention – General Provisions

10.02 – Fire Extinguishers – If the fire chief deems it necessary due to construction, location, character or occupancy – shall be provided per NFPA 10

10.03 (5) – The storage of combustible or flammable material shall be confined to approved storage areas; storage in buildings and structures shall be orderly, shall not be within 2 feet of the ceiling and shall be located so as not to obstruct egress from the building.

10.03 (6) – Open flame devices shall comply with NFPA 101

10.03 (9) – All required fire resistant rated doors or smoke barriers shall be maintained in good working order.

10.03 (11) – When any electrical hazards are identified, such conditions shall be abated. All identified hazardous electrical conditions in permanent wiring shall be brought to the attention of the electrical code official.

10.03 (13) --.... Egress shall at all times be maintained in a safe condition and shall be available for immediate use and free of all obstructions. Aisles, passageways, or stairways in any building shall not be obstructed with tables, showcases...or other obstructions during hours when the building is open to the public...

10.07 --.... Where such structures are of a combustible construction, which may in the opinion of the head of the fire department, constitute a fire hazard.

10.13 – Emergency Planning and Preparedness – The development of emergency plans, training, and conducting of fire exit drills shall comply with the applicable requirements of 527 CMR 10 and 527 CMR 10.13

10.17 – Places of Assembly – The decorations, operation or use of places of assembly and education shall comply with the applicable requirements of 527 CMR 10 and 21 and 780 CMR.

Permit required – A place of assembly or one for educational use shall not be maintained, operated or used as such without a Certificate of Inspection from the building code official. Occupant load shall be posted by the building official as determined by 780 CMR. In the event of overcrowding or obstructions to egress, the head of the fire department can cause the performance (etc.) to be stopped until the posted occupant load is re-established or the obstruction is removed.

If you have any questions contact the Technical Service Unit at the Office of the State Fire Marshal at 978-567-3375 or in Western MA at 413-587-3181. Building officials can contact the Department of Public Safety at 617-727-3200.

Synopsis:**School's Haunted House Burns – One Killed, Two Injured**

In 1973, five members of the Washington Reid School PTA in Prince William County, Virginia built a “haunted house” in one of the elementary school’s classrooms for a Halloween Carnival. Approximately 30 minutes before 200 school children were scheduled to enter the highly combustible maze; fire broke out in the haunted house killing one of the PTA members and injuring two others.

The PTA members had created the effect of a haunted house in one of the classrooms by erecting eight-foot high panels of flannel cloth secured to one by three-inch wood strips. The flannel was then sprayed with a black lacquer-based paint. To reduce light, brown paper was taped over the windows and over the flannel panels directly in front of the windows. “Black lights” were installed with temporary wiring at various locations. Power was supplied to test the lights prior to the start of the function, at which time one of the panels burst into flames. Two PTA members began to tear down the paper while three others went to get fire extinguishers. One member pulled the school fire alarm, which was not connected to the fire department by any means of notification. A PTA member broke into the principal’s office in order to gain access to a phone to call the fire department.

As devastating as this fire was it is fortunate that the school children were not in the building.

Synopsis:**Fire in Haunted Castle Kills Eight**

In May 1984, a rapidly spreading fire destroyed the Haunted Castle amusement facility at the 200 acre Six Flags Great Adventure Park in Jackson Township, New Jersey. At the time of the fire there were three employees and an estimated 28-34 visitors. Eight of the visitors unable to immediately exit from the structure died in the fire. The haunted house was constructed of 17 commercial trailers (each about 8-ft. wide by 40 ft. long). The trailers were connected by use of plywood. The interior of the Haunted Castle was constructed of plywood partitions that created a convoluted path of travel approximately 450 ft. long. Materials used for the interior included synthetic foam, various fabrics and plastics, plywood and tarpaper.

The structure had a total of 7 exits, including the main entrance. Fire protection features were emergency lighting and portable fire extinguishers. The cause of the fire was determined to be by ignition of a wall-mounted polyurethane foam pad by a cigarette lighter.

We would like to acknowledge the National Fire Protection Association (NFPA) for providing the information on these two fires. In both cases, combustible furnishings and lack of fire protection/detection and egress was related directly to the loss of life.